ENVIRONMENTAL ASSESSMENT
NO. AZ 020-2003-0082

REDEVELOPMENT OF ARCH TANK POTHOLE

(#861) IN THE BIG HORN MOUNTAINS WILDERNESS

PREPARED BY

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October, 2003

Public Comments Received From Notice of Proposed Action (NOPA) Inquiry

A Notice of Proposed Action (NOPA) was sent to 483 individuals or groups advising them that a proposal to analyze the proposed action was being considered. Responses were received from 10 individuals or organizations (three via mail, six via e-mail, and one via FAX). Letter #1 asked for clarification regarding the existing and proposed shade structure. Letter #4 requested fair treatment for ranchers. Letters #2 - 7, and 9 were supportive of the project and require no response. Letter #8 was supportive and offered some suggestions to enhance the proposed action. Letter #10 wanted to ensure that habitat for bighorn sheep was protected, but questioned whether enlargement of the water catchment was the strategy to accomplish this goal.

Responses to those letters are found below.

1-1 The existing development has a covering (shade structure) over it to help reduce evaporation. This existing structure is rotten and needs to be replaced. The AGFD has been successful in accomplishing this in other wildernesses by using steel paneling, which is cut irregularly, and colored to match the surrounding terrain. This is a camouflage technique that is used to reduce the outline of the structure to better hide and make the development blend in, thereby making the catchment less noticeable in a wilderness setting.

4-1 Thank you for your comments. All projects are evaluated on a case-by-case basis.

8-1 The suggestion to add a gutter to the shade structure was added to the proposed action. Thank you for the suggestion on camping sites.

8-2 The exact camping area will be determined at a later time, when the cultural and wilderness staff are available to assist with the location. We will attempt to select a camping area that is near to the project site, provides the necessary accommodations, but is still outside the wilderness boundary.

10-1 The Wilderness Regulations are now found in 43 CFR 6300. Under 43 CFR 6303.1(b) “BLM may prescribe conditions under which other Federal, State, or local agencies or their local agents may use, build, or install such items to meet the minimum requirements for protection and administration of the wilderness area, its resources, and users.” As described in the proposed action, because of the steep and rugged terrain, the use of a helicopter was evaluated and determined to be the minimum tool to accomplish the project.

10-2 AGFD has conducted studies of evaporation rates on a variety of catchments and supplied the following information. The evaporation rate, for this area, is estimated at 1 cm/day from April to October, and 0.5 cm/day from November to March. As the adit is created, the pothole deepened, and the cover installed, the water will be essentially protected from evaporation as compared to an exposed surface.

Because of the relatively small population of bighorn sheep currently utilizing this area, the pothole has not been maintained as a perennial source. Resources must be prioritized and the use of helicopters to haul water is a time-consuming and expensive process. The future supplementation of bighorn sheep into this mountain range will increase the priority of this development and make this an important water source to supply this population.

10-3 The Interim Management Policy (IMP) is not relevant to this action. The Big Horn Mountains Wilderness is a Congressionally-established wilderness area and therefore is not covered by the IMP “Lands Under Wilderness Review”.

10-4 The Arizona Game and Fish Department is currently conducting studies relating to the use and value of water sources to wildlife in the Sonoran desert. Their research, which includes collecting data on water quality, and the construction of temporary water sources for wildlife, is expected to take several years to

complete. However, the Arizona Game and Fish Department is responsible for managing Arizona's wildlife populations, and the Bureau of Land Management coordinates and cooperates with the Department on these activities. Many of these topics were fully addressed in EA 020-2002-034 Maintenance of 16 Wildlife Water Catchments within the Sonoran Desert National Monument.

INTRODUCTION

Arch Tank pothole (#861) T.3N. R.9W. SEC. 11 SE ¼ NW ¼, N 33° 37.160' W 113° 09.353', located in the Big Horn Mountains Wilderness, is a desert bighorn sheep development, originally constructed in January, 1982 (see map, Appendix 1). The pothole is located on the western face of a rock escarpment, about 1 mile northwest of Bighorn Peak. The existing pothole is approximately 8' in diameter and 7' deep, artificially enlarged by the addition of a 3' x 20' masonry rock dam. In addition to the dam, other components include an overhead shade structure to reduce evaporation, and a rock filled gabion that inhibits siltation of the pothole.

The Federal Land and Policy Management Act of 1976 (FLPMA), directs the Bureau of Land Management (BLM) to manage Public Lands for the purpose of multiple use and sustained yield. Wilderness management and wildlife management are two such uses covered under the Act. The Arizona Game and Fish Department and the BLM in Arizona cooperate through a Memorandum of Understanding (MOU) to accomplish these mandates.

Under this MOU, the BLM recognizes that AGFD manages the wildlife in the State of Arizona. Both agencies work cooperatively to manage and improve the wildlife resources and their habitat. An International Association of Fish and Wildlife Agencies (IAFWA) appendix to this MOU, specifically relates to actions in wilderness. It allows for the maintenance of existing water supplies, diversions, ditches and associated structures, necessary for fish and wildlife management, which were in existence before wilderness designation. It allows for the development of additional water supplies, but these structures must be constructed in a manner that minimizes the visual impacts on the landscape. This appendix includes permitting the use of explosives, outside of heavy visitor-use periods, when the use of hand tools is not practical.

This Environmental Assessment (EA) will evaluate the impacts of the proposed action and alternatives regarding the redevelopment of Arch Tank pothole. If completed, the redevelopment should provide resident wildlife populations with a more reliable water source and reduce the need for aircraft intrusions into the Big Horn Mountains Wilderness for water hauling or maintenance purposes.

Purpose and Need for the Proposed Action

The Arizona Game and Fish Department has determined that the Big Horn Mountains desert bighorn sheep population is in need of supplementation. As a result, this existing development is being proposed for modification to improve its reliability to support a proposed transplant of bighorn sheep and to reduce or ideally eliminate future aircraft incursions into the Big Horn Mountains Wilderness. The existing pothole goes dry during most summers and therefore does not function as a perennial water source. A functional, perennial, water source must be in place prior to augmentation of the population.

Although well situated in a large block of high quality, contiguous, desert bighorn sheep habitat, the capacity of the pothole to supply resident wildlife populations with perennial water is currently insufficient and unreliable. Currently, supplemental filling of the catchment must occur by helicopter. To improve the permanence of the pothole, the Arizona Game and Fish Department (AGFD) proposes to deepen the pothole and modify the existing shade structure. There is no vehicular access to the site, therefore all materials, tools, and workers must be either transported by helicopter or hiked in. Hiking to the site takes approximately 2 hours and is very difficult due to the steep terrain.

If authorized, redevelopment activities would occur during the winter months, between January and April 2004. An outside contractor will be used to deepen the pothole with explosives, but AGFD staff and volunteers from the Arizona Desert Bighorn Sheep Society will perform all other construction activities.

Conformance with Land Use Plans

Redevelopment of an existing water catchment to provide wildlife safe use and access, conforms to the Lower Gila North Management Framework Plan, WL-2.1, WL 2.2, and WL-2.4 (1983). (See Appendix 2 for list of applicable decisions).

Relationships to Statutes, Regulations and Other Plans

The actions considered in this document are consistent with the Wilderness Act of 1964 (Public Law 88-577) and the Arizona Desert Wilderness Act of 1990 (PL 101-628). The Arizona Desert Wilderness Act of 1990, enlarged the National Wilderness Preservation System and established the approximately 21,000 acre Big Horn Mountains Wilderness. Regulations governing the management of wilderness areas are found in 43 Code of Federal Regulations – Subpart 6303.1, (43 CFR 6303.1). The original BLM Environmental Assessment authorizing the construction of the pothole was completed in 1981 (EA #AZ027-82-01). A Wilderness Management Plan for the Big Horn Mountains has not been written, as yet.

Wildlife issues within the Bighorn Mountains Wilderness were not specifically addressed in the Lower Gila North Habitat Management Plan (HMP) (1983), as it preceded wilderness designation. However, the direction to maintain and enhance bighorn sheep habitat was provided for in the Lower Gila North HMP. Water hauling trips into the Wilderness Area are authorized under the interim Wildlife Operations and Maintenance Plan and Environmental Assessment (EA AZ-026-92-53) for the Big Horn Mountains, Harquahala Mountains, Hummingbird Springs, Signal Mountain, Table Top, Tres Alamos, and Woolsey Peak Wildernesses (1994). These actions are also consistent with the Mountain Sheep Ecosystem Management Strategy in the 11 Western States and Alaska (BLM 1995). BLM and AGFD cooperate under a Master Memorandum of Understanding.

Construction and maintenance of water developments are consistent with the Arizona Game and Fish Department's mission statement, directly tiered to their Wildlife 2006 strategic plan, and is an approved use of Federal Aid funds as outlined in their project narrative and annual job statement.

PROPOSED ACTION AND ALTERNATIVES

Proposed Action

The Arizona Game and Fish Department and the Arizona Desert Bighorn Sheep Society (ADBSS), in cooperation with the Bureau of Land Management, proposes to redevelop Arch Tank Pothole (#861), T.3N. R.9W. SEC. 11 SE ¼ NW ¼, N 33° 37.160' W 113° 09.353, an existing bighorn sheep water development in the Big Horn Mountains Wilderness to support a remnant and supplemental population of big horn sheep and other wildlife in the area. This will be accomplished by increasing its storage capacity, improving reliability, and reducing evaporation. The proposed action will include deepening the existing pothole by blasting a 5' high, 5' wide, 7' long adit with a 45° slope. Excavation of the adit will be accomplished using drills and "Kinepak" explosive. Drilling and explosive detonation will take place between 7 a.m. and 5 p.m. daily for two weekdays prior to the arrival of the ADBSS volunteers. Blasting during weekdays will reduce the disturbance to wilderness visitors seeking solitude, as most visitor encounters occur on the weekends. Detonation of explosives will be by personnel or contractors experienced and/or certified in the use of explosives being used. This information will be provided to BLM personnel prior to initiation of the proposed action.

Water-storage capacity of the existing pothole is currently about 2600 gallons. Excavation of the adit will be increased by an additional 1300 gallons. In addition, the adit will increase the water column depth an additional 5' and help protect the final 5' of water from evaporation. Little or no surface disturbance outside the existing pothole will be associated with creating the adit, and all rock removed during excavation will be spread in the immediate area.

Once the pothole and new adit are cleaned out, they will be sealed with a cement mixture to reduce water loss due to leakage. Fiberglass reinforcement fibers, steel mesh, or adhesives may be used in the mixture to prevent cracking and strengthen the application.

To further improve the permanence of Arch Tank by reducing evaporation, the existing dilapidated, shade structure will be replaced with a new shade structure constructed of steel paneling. Steel paneling is more durable, and requires less maintenance than does the existing shade material. Several types of camouflage techniques will be employed to ensure the components (e.g. shade cover and existing masonry dam) blend in with the surrounding terrain. The steel paneling can be painted, cut and/or formed to break up its outline and make it unobtrusive. In addition to painting, the shade cover may be covered with pigmented stucco, local rocks, or soil from the area to match the color of surrounding rock. Rain gutters may be installed on the edges of the shade structure to capture and funnel water into the pothole during those precipitation events which do not elicit high flows.

Exposed areas of the existing masonry dam will be painted with a water-based Latex paint, or acid-tinted, a technique that mimics patina, to match the surrounding rocks. In either case, the spray will be controlled so as not to overspray nearby vegetation or the water source. The existing gabion may also be cleaned out and repaired as necessary.

Due to the weight and size of the material, and ruggedness of the terrain, all materials, crew (about 15) and volunteers (about 30) will be transported to and from the site via helicopter. To ensure the pothole is sealed properly, it may be necessary to fill the system with water via helicopter. Gas powered generators, cement mixers, compressors, and welders, as well as electric power saws, drills, pipe threaders and other miscellaneous tools will be necessary to accomplish this project.

Any materials replaced at the project site and other extraneous construction materials will be removed from the wilderness and disposed of properly. Disturbed areas will be contoured to blend in with the surrounding area. Disturbance to vegetation will be kept to a minimum. Workers will camp outside the wilderness in a location designated by a BLM representative. The entire project is estimated to take approximately 8 to 16 days to complete, sometime between January 1 and April 30th, 2004.

Alternatives (Including No Action)

Alternative A

Under Alternative A, a masonry dam, gabion, and shade structure will be constructed at an existing natural, undeveloped, pothole (T.3 N. R.9 W. S. 2 NW.1/4 SE.1/4, 33° 37.794' 113° 8.995'). This pothole is also within the Big Horn Mountains Wilderness and is situated within the same large block of high quality, contiguous, bighorn sheep habitat as Arch Tank. The volume of the natural pothole is about 2500 gallons, however the substrate is too porous to use as a permanent water source. Alternative A proposes to construct a masonry dam (2'- 6'high and 30' long), a diversion gabion (6' high and 51' long) and shade structure (10' x 10') at this pothole. The pothole resulting from this proposed action would have a vertical water column of 15' and a volume of about 10,000 gallons.

The masonry dam would be built from rough-face concrete block over a lattice of drilled rebar and filled with concrete. The interior of the pothole would be sealed with a masonry product such as Thoroseal, to prevent leakage. Both the exterior and interior surfaces will use pigmented masonry products or be acid-tinted to match the surrounding rock, as described in the Proposed Action.

The gabion will be situated above the existing pothole, to capture sediment and prevent the pothole from being filled in with debris. Gabion construction will use 2" square or round steel pipe set into drilled holes and galvanized 4" mesh to create the rock-filled baskets.
Shade construction will use 2" square steel pipe, and plate steel to form a structure shading only the inner (deep) portion of the pothole. The shade structure will rise 3' above the surrounding rock. Several types

of camouflage techniques will be employed to ensure the components (e.g. shade cover and existing masonry dam) blend in with the surrounding terrain. In addition to painting, the shade cover may be covered with pigmented stucco, local rocks, or soil from the area to match the color of surrounding rock.

Because burros occur in the vicinity, and the water development may be accessible to burros, an exclusionary fence may be constructed. If an exclusionary fence is needed, it would consist of two 15' sections, one upstream and one downstream, to exclude burro access via the canyon bottom. The fence consists of 1 ½" round, pipe-rail fence posts, concreted into the ground, with ½" round, pipe-rail used as rails, spaced to BLM wildlife-friendly specifications, with the bottom rail, spaced at 18" above-ground. The pipe-rail fence will be allowed to oxidize naturally, to better blend in with the surrounding environment.

Due to the weight and size of the material, and ruggedness of the terrain, all materials, crew (about 15) and volunteers (about 30) will be transported to and from the site via helicopter. To ensure the pothole is sealed properly it may be necessary to fill the system with water via helicopter. Gas powered generators, cement mixers, compressors, and welders, as well as electric power saws, drills, pipe threaders and other miscellaneous tools will be necessary to accomplish this project.

Any materials placed at the project site and other extraneous construction materials will be removed from the wilderness and disposed of properly. Disturbed areas will be contoured to blend in with the surrounding area. Disturbance to vegetation will be kept to a minimum or non-existent. Workers will camp outside the wilderness in a location designated by a BLM representative. The entire project is estimated to take approximately 8 to 16 days to complete, sometime between January 1 and April 30th, 2004.

Alternative B

Alternative B proposes to construct a new water development for desert bighorn sheep, outside the Big Horn Mountains Wilderness, in T.4N. R.6W. S.31 SW.1/4 SE.1/4, 33° 38.476' 112° 54.459', in the Belmont Mountains. The Arizona Game and Fish Department has completed a draft transplant proposal for the Big Horn/Belmont Mountains that includes mapping of habitat quality. As part of the transplant proposal, AGFD has conducted two extensive helicopter reconnaissance flights to identify existing and potential water sites within the proposal area. Three areas contained blocks of excellent habitat: Bighorn Peak, Sugarloaf Mountain and the Belmont Mountains. Only the Belmont Mountains contain significant amounts of good or excellent habitat outside wilderness.

Under Alternative B, AGFD proposes to excavate a 45° adit, 5' tall x 5' wide x 15' deep and construct two small (2' x 4') masonry diversion dams. Excavation of the adit will be accomplished using drills and "Kinepak" explosives. Drilling and explosive detonation will take place between 7 a.m. and 5 p.m. daily for two weekdays prior to the arrival of the ADBSS volunteers. Blasting during weekdays will reduce the disturbance to wilderness visitors seeking solitude, as most visitor encounters occur on the weekends. Detonation of explosives will be by personnel or contractors experienced and/or certified in the use of explosives being used. This information will be provided to BLM personnel prior to initiation of the proposed action.

Once blasting is completed, the new adit will be sealed with a cement mixture to reduce water loss due to leakage. Fiberglass reinforcement fibers, steel mesh, or adhesives may be used in the mixture to prevent cracking and strengthen the application. Two masonry dams (2'x4') using native rock from the site will be used to divert water into the mouth of the adit and to keep debris from entering the adit. Rock debris resulting from excavation of the adit will be spread in the retention basin and wash bottom down stream from the project. Water storage in the adit will be about 2300 gallons.

Due to the weight and size of the material, and ruggedness of the terrain, all materials, will be transported to and from the site via helicopter. Crewmembers and volunteers will make the 30-minute walk to the site. To ensure the pothole is sealed properly it may be necessary to fill the system with water via helicopter.

Gas powered generators, cement mixers, compressors, and welders, as well as electric power saws, drills, pipe threaders and other miscellaneous tools will be necessary to accomplish this project.

Any materials placed at the project site and other extraneous construction materials will be removed from the site and disposed of properly. Disturbed areas will be contoured to blend in with the surrounding area. Disturbance to vegetation will be kept to a minimum. Workers will camp in a suitable location near the site designated by a BLM representative. The entire project is estimated to take approximately 8 to 16 days to complete, sometime between January 1 and April 30th, 2004.

Alternative C

Under Alternative C, AGFD proposes to seal the interior surface of Arch Tank, T.3N. R.9W. Sec. 11 SE ¼ NW ¼, N 33° 37.160' W 113° 09.353', with a cement-based product (e.g. mortar, Thoroseal), to reduce water loss due to leakage through natural fissures and cracks in the rock. Fiberglass reinforcement fibers or steel mesh may be integrated into the cement mixture to prevent cracking and strengthen the application. The cement mixture will be applied to the pothole surface using hand tools, in 1-3 layers. The cement mixture will be colored to match the original rock as best as possible. Exposed areas of the existing masonry dam will be painted with a water based Latex paint or acid-tinted, a technique that mimics patina, to match the surrounding rocks.

No surface disturbance outside the existing pothole will occur. Some sand, gravel, and rock debris may be removed from the bottom, and placed outside the pothole but within the drainage. Some cement product may be spilled in the mixing area and will be cleaned up as best as possible. Any residual cement product will be colored with stain, or soil.

To further increase the water permanence of Arch Tank, the existing shade cloth material will be replaced with steel paneling to reduce evaporation. The steel paneling is more durable, and requires less maintenance than does the existing shade material. The steel paneling will be attached to the existing frame. The steel paneling can be painted, cut/and or formed to break up its outline and make it unobtrusive. Several other types of camouflage techniques may be employed to ensure the shade cover blends in with the surrounding terrain, including paint, pigmented stucco, covering with rock or soil to match the surroundings.

Due to the weight and size of the material, and ruggedness of the terrain, all materials and crew will be transported to and from the site via helicopter. To ensure the pothole is sealed properly it may be necessary to fill the system with water via helicopter. Gas powered generators, cement mixers, compressors, and welders, as well as electric power saws, drills, pipe threaders, saws, and other miscellaneous tools will be necessary to accomplish this project.

Any materials replaced at the project site and other extraneous construction materials will be removed from the wilderness and disposed of properly. Disturbed areas will be contoured to blend in with the surrounding area. Disturbance to vegetation will be kept to a minimum. Workers will camp outside the wilderness in a location designated by a BLM representative. The entire project is estimated to take approximately 8 to 16 days to complete, and occur sometime between January 1 and April 30th, 2004.

Water hauling by helicopter would continue as needed during dry periods, as currently authorized in the Wildlife Operations and Maintenance Plan for the Big Horn Mountains, Harquahala Mountains, Hummingbird Springs, Signal Mountain, Table Top, Tres Alamos and Woolsey Peak Wildernesses (1994).

No Action Alternative

Under the No Action Alternative, the pothole would not be redeveloped in any manner. Water hauling by helicopter would continue as needed during dry periods, as currently authorized in the Wildlife Operations

and Maintenance Plan for the Big Horn Mountains, Harquahala Mountains, Hummingbird Springs, Signal Mountain, Table Top, Tres Alamos and Woolsey Peak Wildernesses (1994).

AFFECTED ENVIRONMENT

General Setting and Affected Resources

The Big Horn Wilderness is approximately 50 miles west of Phoenix, and 15 miles northwest of Tonopah, in western Maricopa County, Arizona. The 21,000-acre wilderness encompasses approximately 20% of the Big Horn Mountains and is adjacent to the Hummingbird Springs Wilderness. The Big Horn Wilderness offers excellent opportunities for primitive and unconfined recreational activities, such as backpacking, hiking, hunting, and wildlife viewing.

Tonopah, is an unincorporated community, nearest the proposed project site. The population of the area is currently estimated at 2700 (BLM 2000). Future growth is expected to dramatically increase in the next decade as towns and cities annex county lands and expand their boundaries to accommodate expected economic expansion. Major employment opportunities include agriculture, construction, retail and service industries, and Palo Verde Nuclear Generating Station.

The town of Buckeye, is the nearest incorporated town, within 35 miles of the project site. U.S. Census data from 2000, describes Buckeye's demographics as approximately 57% White, 37% Hispanic, 3% African-American, 1% Native American, and 2% other. Approximately 16% of the population of Buckeye lives below the poverty level. Figures from the unincorporated area were not available from the Census Bureau but are expected to be roughly the same as those identified for Buckeye, Arizona.

Wildlife occurring in the area include: bighorn sheep, mule deer, coyotes, gray foxes, javelina, Gambel's quail, doves, various bat species, desert tortoises, Gila monsters, various rattlesnakes, and other non-game species. The plant communities occurring at or near the site is representative of Upper Sonoran Desert Scrub. A more complete description of the vegetation in the area and other information can be found in the Upper Sonoran Final Wilderness Environmental Impact Statement (BLM 1987).

Mean monthly precipitation (ppt.) rates (1951-1994) from Tonopah, Maricopa County, AZ, the nearest town to the project site, shows that the months of April (0.24"), May (0.04"), and September (0.36") are the driest months, with ppt. rates less than 0.5". The months of June (0.56"), August (0.58"), and October (0.61"), received an average of less than 0.75" over this 43 year period. January (0.96"), February (0.93") and March (0.82") received an average of less than 1.00". The wettest months were November (1.18"), and July (1.14"), with the greatest amount of precipitation falling in December (7.46") (http://www.wrcc.dri.edu/COMPARATIVE.html, accessed September 29, 2003).

ENVIRONMENTAL IMPACTS

The following resources have been analyzed and are either not present or will not be impacted by the Proposed Action or the Alternative Actions.

1) Water Quality
2) Riparian or Wetland Zones
3) Wild and Scenic Rivers
4) Hazardous or Solid Wastes
5) Prime or Unique Farmland
6) Areas of Critical Environmental Concern Designation
7) Threatened or Endangered Species
8) Flood Plains

9) Native American Religious Concerns

Impacts of the Proposed Action

Wilderness Resources

Noise associated with redevelopment of the pothole may temporarily disrupt some visitors' wilderness experience. Those persons wishing to experience solitude and primitive recreational activities may be temporarily disturbed by the use of motorized and mechanized equipment, and blasting, within the wilderness. The use of explosives to deepen the pothole will be completed within 1-2 days. Additional noise will be generated by a concrete mixer, compressor, and generator that will run sporadically for 3 days, and consistently (during daylight hours) for at least two days, and helicopter use transporting materials and personnel to the project site. Much of the construction work and helicopter flights will occur on weekdays and one weekend, and always during daylight hours to minimize impacts to weekend visitors.

Overall, the construction activities associated with the redevelopment will likely have less impact to wilderness resources than the current condition since significantly fewer, if any, helicopter water hauling trips will be required after the proposed modifications.

Visual Resources

Man-made structures within wilderness will always affect the visual resource in some manner. Visual resources will be primarily affected over the short term, during the construction phase due to the presence of a people and multiple helicopter sorties. To the greatest extent practicable, the pothole components will be made as inconspicuous as possible, using various camouflage techniques as described in the proposed action. Total visual resources will be improved from the current condition since the proposed action includes no new structures and the existing structures will be camouflaged to match the surrounding terrain. No new roads or clearings will be constructed as a result of this project.

Soils

Arch Tank's location high on a basalt outcropping has not allowed a significant amount of soil to develop or be deposited. As such, no surface soil disturbance will occur while the adit is created within the existing pothole. Debris blasted out of the pothole will be dispersed downstream in the same drainage or spread in the immediate area to match the existing land contours. A minimal amount of soil disturbance will occur while working at and around the site, and while staging the materials and equipment. Surface disturbance will be restricted to a very small area around the existing pothole site.

Air Quality

Under the proposed action air quality will be temporarily affected by blasting, construction activities, and helicopter use, resulting in an increase in particulate matter. The increase in particulate matter will be temporary, lasting approximately 2 weeks. The amount of particulate matter released in the air is expected to be less than that released by on-going construction activities or the plowing of agricultural fields within Maricopa County. Although Maricopa County is a non-attainment area for particulate matter, it is expected that by redeveloping Arch Tank, air quality will be improved, in the long term, since significantly fewer, if any, helicopter water hauling trips will be required after the proposed modifications.

Wildlife

Wildlife use within the area will increase due to the proposed bighorn sheep transplant and creation of a perennial water source. Increased human activity and noise associated with redevelopment activities

could have a temporary negative impact, as wildlife will likely leave the immediate project area during the redevelopment activities. Impacts to wildlife are considered to be temporary, lasting the duration of the project, approximately 8 to 16 days. Over the long term, disturbance to wildlife by humans will decrease since activities associated with filling the catchment via helicopter will be reduced or eliminated. The proposed redevelopment activities will occur during the cooler, non-critical time of the year, so as to not deprive wildlife of water. Water may be flown to the pothole upon completion of the project.

No federally threatened, endangered, proposed or candidate species are known to occur in the area. The pothole occurs within BLM Category II desert tortoise habitat. Redevelopment of the catchment will not affect the desert tortoise because the pothole and surrounding area, does not contain suitable desert tortoise habitat. In addition, the project will be constructed during the winter or early spring prior to the tortoise's emergence from hibernation. If observed within the project area, desert tortoises will be moved a safe distance away (according to Arizona Game and Fish Department protocol) and released unharmed. When feasible, other wildlife (e.g. invertebrates, small mammals and reptiles etc.) encountered within the construction zone will be moved out of harm's way, likely less than 100' from the project site.

Botanical Resources

Some plants may be intentionally removed, trimmed or accidentally crushed during construction activities. Reasonable attempts will be made to minimize these impacts, particularly to species protected by the Arizona Native Plant Statues, Category A, "Highly Safeguarded Protected Native Plants". Individual plants in good condition and in harm's way may be transplanted to suitable sites near the catchment site.

Invasive species

No soil, plants, animals, or other living organism will be knowingly transported to the project site. Machinery and equipment will be inspected for residual soil or vegetation (or life stages thereof) and removed if present, before being transported into the wilderness area. Water used to fill the pothole will be potable or originate from well sources.

Cultural/Paleontological Resources

Arch Tank's location high on a basalt outcrop is not typical of areas showing evidence of human use. A cultural clearance by a Phoenix District archaeologist, in 1981, did not reveal evidence of cultural resources.

Recreation

Recreation opportunities will increase as a result of selection of the proposed action. This perennial water source will be critical for the long-term survival of a re-established desert bighorn sheep population in the area. It is anticipated that re-establishment of the bighorn sheep herd in the area could provide 3 hunting permits per year, on average. Data from the 2001 National Hunting and Fishing Survey (USFWS) indicate that this level of permitting would result in about $9,000 annually contributed to the economy in perpetuity.

The supplementation of bighorn sheep to the wilderness would provide additional opportunities for wildlife viewing and photography. Contributions to the economy associated with the non-consumptive use of a re-established bighorn sheep herd is more difficult to quantify but likely would be significant.

Burros

Arch Tank is located within the Harquahala Herd Area. This water source is not accessible to burros and therefore any modifications would not affect burros.

Land Tenure

The proposed project falls within a large, contiguous block of public lands. No private lands would be affected and no acquisition or disposal of public lands would be required.

Minerals

Wilderness areas are withdrawn from mineral entry, but subject to valid existing rights. No minerals or saleable materials are present at the development site and therefore there will be no impacts to minerals resources.

Rangeland Resources

The project site is located within the perennial/ephemeral Clem allotment. Because the site is not accessible to cattle, no impact to the grazing allotment is anticipated.

Energy

The proposed action will not have direct or indirect adverse impacts on energy development, production, supply and/or distribution.

Environmental Justice

As described in Executive Order (EO) 12898, the proposed action will have no effect on environmental justice.

Impacts of Alternative A

Wilderness Resources

Noise associated with development of the pothole may temporarily disrupt some visitors' wilderness experience. Those persons wishing to experience solitude and primitive recreational activities may be temporarily disturbed by the use of motorized and mechanized equipment within the wilderness. Noise will be generated by a concrete mixer, compressor, and generator that will run sporadically for 3 days, and consistently (during daylight hours) for at least two days, and helicopter use transporting materials and personnel to the project site. Much of the construction work and helicopter flights will occur on weekdays and one weekend, and always during daylight hours to minimize impacts to weekend visitors.

Overall, the construction activities associated with the development will likely have less impact to wilderness resources than the current condition since significantly less helicopter water hauling will be required after the proposed construction. The presence of new structures in wilderness may have a negative effect on both a visual and aesthetic level.

Visual Resources

Man-made structures within wilderness will always affect the visual resource in some manner. The proposed structures will be located within a small canyon incised into the surrounding rock. As such, the structures will not be visible from ground level until a person is within 100’ of the development. Visual resources will be affected over the short term, during the construction phase due to the presence of a people and multiple helicopter sorties. Over the long term the presence of the gabion and dam structures may have a negative effect on wilderness experiences for some visitors in the immediate vicinity of the structures. To the greatest extent practicable, the pothole components will be as inconspicuous as possible, using various camouflage techniques as described in the proposed action. No new roads or clearings will be constructed as a result of this project.

Soils

Because this project site is located in the bottom of a rock canyon regularly scoured by flood, there has been little or no soil development or accumulation. As such, no surface soil disturbance will occur during the construction of the dam. Rock collection for creation of the gabion will disturb some soil in the vicinity however every effort will be made to utilize rocks from within the canyon bottom before using upland rocks. A minimal amount of soil disturbance will occur while working at and around the site, and while staging the materials and equipment. Surface disturbance will be restricted to a very small area around the existing pothole site.

Air Quality

Under Alternative A, impacts to air quality will be the same as described in the proposed action.

Wildlife

Impacts to wildlife resources will be essentially the same as those identified under the proposed action. Over the long term, disturbance to wildlife, by humans, will decrease since activities associated with filling the nearby Arch Tank via helicopter will be reduced or eliminated.

Botanical Resources

Under Alternative A, impacts to botanical resources will be the same as those analyzed in the proposed action.

Invasive species

Under Alternative A, impacts from invasive species will be the same as those analyzed in the proposed action.

Cultural/Paleontological

A cultural clearance of the site by a BLM archaeologist will be required prior to authorization of Alternative A. A cursory examination during multiple site visits has revealed no evidence of historic or prehistoric use at the construction site. Additional stipulations, including abandonment of this alternative, may be required following further examination of the site and surrounding area.

Recreation

Under Alternative A, impacts to recreation will be the same as those analyzed under the proposed action.

Burros

Because of the porous nature of the substrate associated with the existing pothole to be developed, there is no permanent water. As such, there is no sign of burro use. To preclude possible burro use, the site may be fenced to exclude burro access, as described in Alternative A. There would be no impact to burros as they currently do not use the site for water.

Land Tenure

Under Alternative A, impacts to land tenure would be the same as described in the proposed action.

Minerals

Under Alternative A, impacts to minerals will be the same as those analyzed under the proposed action.

Rangeland Resources

Under Alternative A, impacts to rangeland/grazing resources will be the same as those analyzed under the proposed action.

Energy

Under Alternative A, there will be no direct or indirect adverse impacts on energy development, production, supply and/or distribution.

Environmental Justice

The selection of Alternative A will have no effect on environmental justice.

Impacts of Alternative B

Wilderness Resources

Under Alternative B, the development site is outside wilderness and therefore there would be no impacts to wilderness resources.

Visual Resources

Visual resources will be primarily affected over the short term, during the construction phase due to the presence of a people and multiple helicopter sorties. To the greatest extent practicable, the adit and diversion dam components will be as inconspicuous as possible, using various camouflage techniques as described in the proposed action. Overall visual obtrusion will be relatively low since the diversion dams are small and the only above ground structures. Since the adit and dams are within a narrow rock canyon, surface visibility would not be apparent until someone was within 50' of the project. No new roads or clearings will be constructed as a result of this project.

Soils

The project's location, high in a narrow granite canyon, has allowed a very small amount of soil to develop or be deposited. As such, no surface soil disturbance will occur while the adit is created. Debris blasted out for the adit will be dispersed downstream in the same drainage or spread in the immediate area to match the existing land contours. A minimal amount of soil disturbance will occur while working at and around the site, and while staging the materials and equipment.

Air Quality

Under Alternative B, impacts to air quality will be the same as those analyzed under the proposed action.

Wildlife

Under Alternative B, impacts to wildlife will be the same as those analyzed under the proposed action.

Botanical Resources

Under Alternative B, impacts to botanical resources will be the same as those analyzed under the proposed action.

Invasive species

Under Alternative B, impacts from invasive species will be the same as those analyzed under the proposed action.

Cultural/Paleontological

A cultural clearance of the site by a BLM archaeologist will be required prior to authorization of Alternative B. This project's location relatively high within a steep granitic canyon is not typical of areas showing evidence of human use. A cursory examination during multiple site visits has revealed no evidence of historic or prehistoric use of the site. Additional stipulations, including abandonment of this alternative, may be required following further examination of the site and surrounding area by a BLM archaeologist.

Recreation

Under Alternative B, impacts to recreation will be the same as those analyzed under the proposed action.

Burros

Under Alternative B, impacts to burros will be the same as those analyzed under the proposed action.

Land Tenure

Under Alternative B, impacts to land tenure would be the same as described in the proposed action.

Minerals

Under Alternative B, impacts to minerals will be the same as those analyzed under the proposed action.

Rangeland Resouces

The project site is located within the Sprouse allotment. Under Alternative B, impacts to rangeland /grazing resources will be the same as those analyzed under the proposed action.

Energy

Under Alternative B, there will be no direct or indirect adverse impacts on energy development, production, supply and/or distribution.

Environmental Justice

Under Alternative B, impacts to environmental justice will be the same as those described under the proposed action.

Impacts of Alternative C

Wilderness Resources

Under Alternative C, impacts to wilderness resources will be the same as those analyzed under the

proposed action.

Visual Resources

Under Alternative C, impacts to visual resources will be essentially the same as those analyzed under the proposed action. Overall visual obtrusion will be decreased since existing components that are currently not camouflaged will be camouflaged.

Soils

Under Alternative C, impacts to soils will be essentially the same as those analyzed under the proposed action.

Air Quality

Under Alternative C, impacts to air quality will be essentially the same as those analyzed under the proposed action.

Wildlife

Under Alternative C, impacts to wildlife will be the same as those analyzed under the proposed action.

Botanical Resources

Under Alternative C, impacts to botanical resources will be the same as those analyzed under the proposed action.

Invasive species

Under Alternative C, impacts to soils will be essentially the same as those analyzed under the proposed action.

Cultural/Paleontological

Under Alternative C, there will be no impacts to cultural or paleontological resources.

Recreation

Under Alternative C, impacts to recreation will be the same as those analyzed under the proposed action.

Burros

Under Alternative C, impacts to burros will be the same as those analyzed under the proposed action.

Land Tenure

Under Alternative C, impacts to land tenure would be the same as described in the proposed action.

Minerals

Under Alternative C, impacts to minerals will be essentially the same as those analyzed under the proposed action.

Rangeland Resources

Under Alternative C, impacts to rangeland/grazing resources will be the same as those analyzed under the proposed action.

Energy

Under Alternative C, impacts to energy development, production, supply and/or distribution will be the same as those described under the proposed action.

Environmental Justice

Under Alternative C, impacts to Environmental Justice will be the same as those described under the proposed action.

Impacts of No Action Alternative

Wilderness Resources

Under the No Action Alternative, some visitors' wilderness experience may be disrupted by the occasional presence of a helicopter hauling water to the pothole during dry periods. Over the long term, impacts will increase because periodic water hauling flights will be required once transplanted animals are present. Impacts would be temporary, likely lasting one or two days at a time, two to three times a year.

Visual Resources

Under the No Action Alternative, visual resources would remain unchanged from the current situation. Existing components will not be camouflaged to blend in with the surrounding terrain.

Soils

Under the No Action Alternative, there will be no impacts to soils at Arch Tank because no re-development activity will occur.

Air Quality

Under the No Action Alternative, air quality will be temporarily affected by helicopter flights necessary to refill the catchment, resulting in a slight increase in particulate matter. The increase in particulate matter will be temporary, lasting approximately 1 day, 2 to 3 times per year. The amount of particulate matter released in the air is expected to be less than that released by on-going construction activities or the plowing of agricultural fields within Maricopa County. Although Maricopa County is a non-attainment area for particulate matter, it is expected that air quality will be essentially unchanged from the current situation.

Wildlife

Under the No Action Alternative, wildlife use within the area will not be affected by increased human activity and noise associated with redevelopment activities. Wildlife use is expected to increase due to the proposed bighorn sheep transplant for the area. Over the long term, disturbance to wildlife, by humans, will remain the same, or increase, since the catchment will need to be filled more often to supply the needs of the greater number of animals expected to be released into the area. There will be no effect on threatened, endangered, proposed, or candidate species, nor will the desert tortoise be affected.

Botanical Resources

Under the No Action Alternative, there will be no impacts to botanical resources.

Invasive species

Under the No Action Alternative, there will be no impacts from the possible introduction of invasive species.

Cultural/Paleontological Resources

Under the No Action Alternative, there will be no impacts to cultural or paleontological resources.

Recreation

Under the No Action Alternative, impacts to recreation will be the same as those described in the proposed action.

Burros

Under the No Action Alternative, there will be no impacts to burros.

Land Tenure

Under the No Action Alternative, impacts to land tenure would be the same as described in the proposed action.

Minerals

Under the No Action Alternative, there will be no impacts to minerals.

Rangeland Resources

Under the No Action Alternative, there will be no impacts to rangeland/grazing resources.

Energy

Under the No Action Alternative, there will be no direct or indirect adverse impacts on energy development, production, supply and/or distribution.

Environmental Justice

Under the No Action Alternative, impacts to Environmental Justice will be the same as those described under the proposed action.

RESIDUAL IMPACTS

Residual impacts resulting from the proposed action include a larger pothole as a result of blasting and excavation, a steel panel shade structure and gabion.

The excavated rock will be dispersed downstream from the pothole in the same drainage or spread in the immediate vicinity.

CUMULATIVE IMPACTS

Cumulative impacts associated with the proposed action include a more perennial source of water for wildlife and a more wilderness compatible development.

MITIGATION MEASURES

1. Volunteers and Department staff will camp outside the wilderness area within a marked and mapped area designated by a BLM representative.

2. Portable self-contained chemical toilets are the preferred method for human waste disposal and are required for groups larger than 8 people. Waste from self contained toilets shall be disposed of at State approved sewage disposal facilities.

3. All old water development components and construction debris will be promptly removed from the wilderness area and disposed of properly. Any soil or rock excavated during the creation of the adit will be used for backfill or spread in the immediate vicinity. Disturbed areas will be contoured to blend in with the surrounding area.

4. Disturbance to native vegetation will be kept to a minimum and in accordance with the Arizona Native Plant statutes.

5. Aboveground structures will be camouflaged (e.g. painted or covered with native rocks, concrete, organic debris, or soil) to make them as unobtrusive as possible.

6. When possible the majority of construction activities will occur during daylight hours on weekdays to minimize impacts to weekend wilderness visitors.

7. Drilling and explosive detonation will take place between 7 a.m. and 5 p.m. daily for two weekdays prior to the arrival of the volunteers. Detonation of explosives will be by personnel or contractors experienced and/or certified in the use of explosives. This information will be provided to BLM personnel prior to initiation of the proposed action

8. If desert tortoises are encountered within the project area, workers will follow Arizona Game and Fish Department protocol to move them from the project site and out of harm's way.

9. Should any archaeological artifacts be found during the redevelopment, the Phoenix Field Office archaeologist will be notified immediately. All work will cease until an evaluation of the discovery is made by the authorized officer to determine appropriate actions to prevent the loss of significant cultural or scientific values.

10. Firewood will not be taken from the wilderness, but will be brought in from outside. All fire rings will be scattered following disbandment of camping activities.

CONSULTATION AND COORDINATION

Persons and Agencies Consulted

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Map

Applicable Decisions, from the Lower Gila North Management Framework Plan, Lower Gila North Habitat Management Plan, Related to Redevelopment of Arch Tank Pothole

WL-2.1. Cooperate with Arizona Game and Fish Department to develop big game water catchments on pubic land sties designated in the Lower Gila North Habitat Management Plan.

WL-2.2. Reduce competition for cover, water, and space between big game, livestock and burros by reducing livestock aggregations and removing all burros at waters in the Big Horn, Granite Wash, and Harquahala Mountains by FY 87.

WL 2-4. Avoid subdividing bighorn sheep lambing areas with fencing and monitor livestock use of these key areas. Negotiate with range users to alleviate competition, where documented.

Lower Gila North Habitat Management Plan, Objective A (1983).

Maintain and enhance bighorn sheep habitat in the Harquahalas, Granite Wash Mountains, Little Harquahalas, Plomosa Mountains, New Water Mountains and Bighorn Mountains by year 2000. - (WL-2.1,). Maintain current sheep carrying capacity in Plomosa and New Water Mountains. In Harquahalas, Granite Wash, Little Harquahalas, and Bighorn Mountains increase sheep carrying capacity by 15 sheep per range by year 2000.

Wildlife Operations and Maintenance Plan for the Big Horn Mountains, Harquahala Mountains, Hummingbird Springs, Signal Mountain, Table Top, Tres Alamos, and Woolsey Peak Wilderness Areas (1994).

III A. 1a 1. Aerial census of game populations may continue tin these Areas. The activity supports both the wildlife management goals of BLM and the AGFD and the intent of Congress expressed in the Arizona Desert Wilderness Act.

III A. 1a 2. The Arizona Game and Fish Department will notify BLM at least two weeks prior to scheduled flights.

III A. 1a 4. All efforts will be made to combine tasks (inspection, telemetry, census) into single flight operations.

III A. 1c. The Arizona Game and Fish Department supplements the water storage supplies of some catchments when they are in imminent danger of going dry. Signal Peak Pothole (AGFD #942 – T. 2 S., 7 W., Sec. 34) is the only development in these area that normally requires supplementation. However, it is possible that Bunyan Peak Catchment (AGFD #995 - T. 4 S., R. 7 W., Sec. 3) and Woolsey Peak Tank (AGFD #951 - T. 3 S., R. 5 W., Sec. 15) in the Woolsey Peak Wilderness and **Arch Tank (AGFD #951 – T. 3 N., R. 9 W., Sec. 11) in the Big Horn Mountains Wilderness** may require supplementation.

III A. 1c3. The only limitation placed on supplementation flights are that they be conducted in one day and on a week day to minimize impacts on recreation and wilderness values.

III B. 1. Maintenance of existing structures – Existing structures within the subject wilderness areas include the water developments numbered: 347, 375, 554, 705, 811, 861, 942, 956, **951,** and 995. Any repairs or emergencies that are discovered from inspection may require motorized access to employ repairs.

III B. 1.1. Continued operation of these facilities in good working order is the management objective. Motorized access to all sites is granted only if it is the minimum tool necessary to accomplish the task

(heavy equipment/parts required for a summer emergency). Access will be along previously established routes.

III B. 1.2. The Arizona Game and Fish Department will notify BLM at least one week prior to initiating repairs and again upon their completion.

III B. 2. Wildlife Transplants/Supplements. The management of wildlife in wilderness is meant to mimic natural conditions. Management and restoration of historical populations is also provided for. The modification of water developments will be considered in order to assist restoration of wildlife populations to historical or secure management levels and to reduce man-made impacts from repeated long-term maintenance.

III B. 2.3. Visual impacts of existing catchments will be evaluated. And where appropriate, modifications will be made to reduce these impacts through surface protection schemes such as camouflage/screening alterations.

III B. 2.4. Any modifications made are subject to individual site-specific Environmental Assessments and will be made to be as unobtrusive and natural-looking as possible.

III C. 1. Gross manipulation of wildlife populations in wilderness areas is not consistent with wilderness guidelines. Exceptions to this are provided for recovery of Threatened and Endangered Species, and to restore indigenous populations reduced by human influence.

III C. 1.1. No transplants or supplements are foreseen for these areas during the life of this plan. However, should populations fall below secure levels, as determined by the AGFD, supplementation is in agreement with preservation of wilderness values.

III C. 1.2. Temporary structures and use of motorized/mechanized equipment may be authorized to aid the procedure so long as their use is the minimum necessary to accomplish the task.

III C. 1.3. Site specific environmental assessments will be prepared for transplant/supplement operations, if such operations are proposed in the future.